Small Business Innovation Research (SBIR) and
Small Business Technology Transfer (STTR)
Opportunity Announcement
HR001120S0019-09
Organizational Modeling

Which program will fund this topic?
SBIR
What type of proposals will be accepted?
Direct to Phase II (DP2) Only

Technology Area(s): Information Systems
DARPA Program: Multi Domain Analytics

I. INTRODUCTION

The Defense Advanced Research Projects Agency (DARPA) Small Business Programs Office (SBPO) is issuing an SBIR/STTR Opportunity (SBO) inviting submissions of innovative research concepts in the technical domain(s) of Information Systems. In particular, DARPA is interested in understanding the feasibility of Organizational Modeling.

This SBO is issued under the Broad Agency Announcement (BAA) for SBIR/STTR, HR001120S0019. All proposals in response to the technical area(s) described herein will be submitted in accordance with the instructions provided under HR001120S0019, found here: https://beta.sam.gov/opp/b8abeb02f16a4450b2c2f859fc00c177/view.

a. Eligibility

The eligibility requirements for the SBIR/STTR programs are unique and do not correspond to those of other small business programs. Please refer to Section 3.1, Eligible Applicants, of HR001120S0019 for full eligibility requirements.

b. Anticipated Structure/Award Information

Please refer to Section 1, Funding Opportunity Description provided in HR001120S0019 for detailed information regarding SBIR/STTR phase structure and flexibility.

If a proposer can provide adequate documentation to substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications, the Direct to Phase II (DP2) authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of an SBIR program. This SBO is accepting DP2 proposal submissions.

DARPA will accept DP2 proposals for cost of up to $1,750,000. This includes a 9-month base period not to exceed a cost of $750,000 and a 9-month option period not to exceed a

cost of $750,000. A separately priced option of up to $250,000 must also be proposed for contractors who would like to be considered for participation in the DARPA Entrepreneurial Investigator Initiative. Refer to Section 2.6, DARPA Embedded Entrepreneur Initiative, of HR001120S0019 for detailed information on EEI.

Proposers should refer to Section 4, Application and Submission Information, of HR001120S0019 for detailed proposal preparation instructions. Proposals that do not comply with the requirements detailed in HR001120S0019 and the research objectives of this SBO are considered non-conforming and therefore are not evaluated nor considered for award.

DP2 Feasibility Documentation shall not exceed 20 pages. DP2 Technical Proposal shall not exceed 40 pages. Phase II commercialization strategy shall not exceed 5 pages. It should be the last section of the Technical Volume and will not count against the 40-page limit. Please refer to Appendix B of HR001120S0019 for detailed instructions on DP2 proposal preparation.

c. Human Subjects Research (HSR)/Animal Use

Proposers that anticipate involving Human Subjects Research or Animal Use must comply with the approval procedures detailed at http://www.darpa.mil/work-with-us/additional-baa. For more information, refer to Section 4.7, Human Subjects/Research/Animal Use, of HR001120S0019.

Proposers are highly encouraged to clearly segregate research tasks from human and/or animal testing tasks to allow for partial funding while internal and DoD approvals are being obtained.

d. Evaluation of Proposals

Section 5, Evaluation of Proposals, in HR001120S0019 provides detailed information on proposal evaluation and the selection process for this SBO.

e. Due Date/Time

Full proposal packages (Proposal Cover Sheet, Technical Volume, Price/Cost Volume inclusive of supporting documentation, and Company Commercialization Report) must be submitted via the DoD SBIR/STTR Proposal Submission website per the instructions outlined in HR001120S0019 no later than **2:00 pm ET, June 29, 2020.**

II. TOPIC OVERVIEW

a. Objective

Develop new technology for the automated analysis and assessment of organizations' actions and communications in context to (a) identify tactics and appropriate counter-measures, and (b) inform a better understanding of strategy to include messaging, structure, and inferred intentions.

b. **Description**

There is a DoD need for better assessment of US adversaries' tactical, operational, and global strategies. Currently, analysts use a variety of tools and techniques to understand and anticipate organizations' messaging and influence campaigns but many gaps remain. Few methods integrate both events and communications in context to accurately understand an adversary's strategy and develop appropriate countermeasures. Additionally, the lack of automation results in massive amounts of unmined data or improperly parsed datasets.

In the commercial world, advertising agencies perform surveys and polls to understand clients' and their competitors' messaging campaigns and the perceived results on the target audience. Statistical processing of the data is performed, but higher level analysis is done using human judgement.

Computational advertising does employ extensive automated analyses (Google and Amazon, for example). This advertising is focused on individuals, not organizations. Nevertheless, some of these computational techniques should be extensible to analyzing organizations and their messaging campaigns.

The automated organizational modeling system to be developed for this SBIR topic should demonstrate an integrated communication - event forecasting capability. This system should: include the identification of relevant data sources; address the analysis of communications and behaviors from entities and global events; and be verified through case studies of real-world events.

c. Phase I

This SBO is accepting Direct to Phase II proposals ONLY. Proposers must demonstrate that feasibility of the following has been achieved outside of the SBIR program: research has been conducted to confirm that publicly available data can support analysis and development for Phase II. Additionally, performers must show specific examples of analysis incorporating both events and communications for anticipating future behaviors.

To demonstrate Phase I feasibility, the proposer should provide no more than 20 pages of documentation. The report should contain actual case studies citing data sources used, identifying specific communications and behaviors, and clearly illustrating how this analysis can be used to understand strategy and predict future behavior.

d. Phase II

The performer should take a phased approach to ultimately demonstrate an integrated communication - event forecasting capability. This approach should: include the identification of relevant data sources; address the analysis of communications and behaviors from entities and global events; and be verified through case studies of real-world events.

Methods and analytics should be demonstrated to work across multiple datasets (e.g. news articles, social media, event data) and should be fully scalable to large and complex

datasets. Performer should also address potential issues such as language translation, incorporating contextual information, and identification of relevant data.

Schedule/Milestones/Deliverables
Phase II fixed milestones for this program should include:

- Month 1: Kickoff meeting. Initial design, schedule, and milestones
- Month 9: Demonstration of communication analysis methods related to forecasting
    a. Method for identifying relevant data and applying sampling techniques
    b. Documented analytic approach for communication analysis with case studies
    c. System wireframe for communication analysis
    d. Initial demonstration of forecasting capabilities related to method
- Month 12: Demonstration of event/behavioral analysis methods
    a. Method for identifying relevant data and applying sampling techniques
    b. Documented analytic approach for event/behavioral analysis with case studies
    c. System wireframe for event analysis
    d. Initial demonstration of forecasting capabilities related to method
- Month 15: Demonstrate initial integrated communication - event forecasting capability on existing case study from earlier milestones
- Month 18: Demonstrate integrated communication - event forecasting capability on new case study
    a. Documentation of full analytic process
    b. Documentation of final prototype architectures and algorithms
    c. Documentation of results, comparisons with alternative methods, and quantification of accuracy, robustness, and generalizability

e. Dual Use Applications (Phase III)
DoD/military applications are for Intelligence, Psychological Operations, overt and covert influence.

Commercial application of this technology includes commercial marketing/communications, threat intelligence, risk analysis, and market

f. References
[1] Rogers, E. M. (2003). Diffusion of innovations. New York: Free Press

[2] Armstrong, J. S. (1983). Strategic Planning and Forecasting Fundamentals. Retrieved from http://repository.upenn.edu/ marketing_papers/123

[3] Kim, Y.H., Kang, H., & Jong Kyu Lee, J.K. (2018). Can Big Data Forecast North Korean Military Aggression?, Defence and Peace Economics, 29:6, 666-683, DOI: 10.1080/10242694.2016.1270736

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Forecasting in International Relations and Economics. International Studies Review, Volume 1, Issue 2, Pages 11–41. Retrieved from https://doi.org/10.1111/1521-9488.00154

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[6] Feder, S. (2002). Forecasting for Policy Making in the Post-Cold War Period. Annual Review of Political Science 2002 5:1, 111-125.

[7] Qiao, F., Zhang, X., Li, P., Ding, Z., Cheng, J., and Wang, H. (2017 May). Predicting Social Unrest Events with Hidden Markov Models Using GDELT. Discrete Dynamics in Nature and Society 2017:1-13.

[8] Schrodt, P. and Yonamine, J. (2013 July). A Guide to Event Data: Past, Present, and Future. All Azimuth. Retrieved from http://www.allazimuth.com/2017/07/22/a-guide-to-event-data-past-present-and-future/

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g. Keywords

Influence, events and communications, messaging, observables, behaviors, forecasting, prediction, propaganda Computational social science, data analytics, computational advertising, artificial intelligence, machine learning, software development, computer science

III. SUBMISSION OF QUESTIONS

DARPA intends to use electronic mail for all correspondence regarding this SBO. Questions related to the technical aspect of the research objectives and awards specifically related to this SBO should be emailed to HR001120S0019@darpa.mil. Please reference BAA HR001120S0019-09 in the subject line. All questions must be in English and must include the name, email address, and the telephone number of a point of contact.

DARPA will attempt to answer questions in a timely manner; however, questions submitted within seven (7) calendar days of the proposal due date listed herein may not be answered. DARPA will post a consolidated Frequently Asked Questions (FAQ) document. To access the posting please visit: http://www.darpa.mil/work-with-us/opportunities. Under the

HR001120S0019-09 summary, there will be a link to the FAQ. The FAQ will be updated on an ongoing basis until one week prior to the proposal due date.

In addition to the FAQ specific to this SBO, proposers should also review the SBIR/STTR General FAQ list at: http://www.darpa.mil/work-with-us/opportunities?tFilter=&oFilter=29934. Under the HR001120S0019 summary, there is a link to the general FAQ.

Technical support for the Defense SBIR/STTR Innovation Portal (DSIP) is available Monday through Friday, 9:00 a.m. – 5:00 p.m. ET. Requests for technical support must be emailed to DoDSBIRSupport@reisystems.com with a copy to HR001120S0019@darpa.mil.